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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/510,263	12/29/2004	Avner Badhei	66518-8002.US02	1621

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EXAMINER	
KUO, WENSING W	
ART UNIT	**PAPER NUMBER**
2826	
MAIL DATE	**DELIVERY MODE**
09/29/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/510,263	BADHEI ET AL.	
	Examiner	Art Unit	
	W. Wendy Kuo	2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 August 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *173-195* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *173-195* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 October 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *04/21/2005; 07/06/2005; 02/12/2008; 03/25/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group O, directed to claims 173-195 in the reply filed on 12 August 2008 is acknowledged.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 173-176, 178, 181, and 192-195 are rejected under 35 U.S.C. 102(b) as being anticipated by Hauer et al. (US 5,600,741) (hereinafter Hauer).

4. **With respect to claim 173,** Hauer (e.g. Figure 1) teaches an integrated circuit, comprising:

- A semiconductor substrate 11 having electrical circuitry coupled to an optoelectronic device 9 (column 4, lines 61-66) disposed on a first surface of the semiconductor substrate 11, the semiconductor substrate having a notch (3, 4) extending from a second surface of the semiconductor substrate towards the first surface;
- Wherein the notch (3, 4) at least partially overlaps with the optoelectronic device 9 on the first surface;

- An optical reflector assembly disposed within the notch; wherein, the optical reflector assembly is physically configured for optical coupling with the optoelectronic device (column 6, lines 63-67 - column 7, lines 1-4)

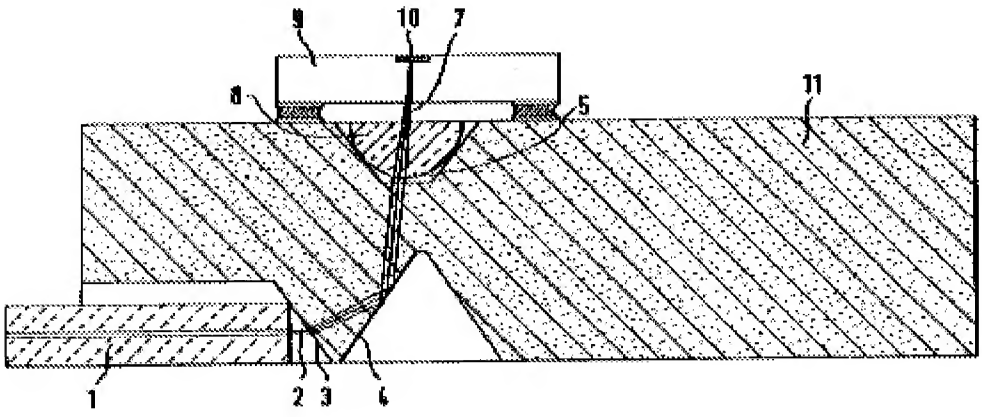

FIG. 1

5. **With respect to claim 174,** Hauer (e.g. Figure 1) teaches an optical fiber 1 disposed on the second surface of the semiconductor substrate, the optical fiber having a core region.

6. **With respect to claim 175,** Hauer teaches that the optical reflector assembly is physically configured for optical coupling with the core region of the optical fiber.

7. **With respect to claim 176,** Hauer teaches that the optoelectronic device is one of a laser, a vertical-cavity surface-emitting laser, a photodiode, a waveguide, an array waveguide grating, and an optical amplifier (column 3, line 27).

8. **With respect to claim 178,** Hauer (e.g. Figure 1) teaches that the optoelectronic device is coupled to said semiconductor substrate via flip-chip mounting.

9. **With respect to claim 181,** Hauer teaches that the notch comprises an inclined surface; wherein, the inclined surface is inclined relative to the first surface and extends through at least the core region of the optical fiber.

10. **With respect to claim 192,** Hauer teaches that the optoelectronic device is configured to operate with light of substantially the wavelength spectrum and the semiconductor substrate is absorbing for light of substantially the wavelength spectrum (column 4, lines 61-66).

11. **With respect to claim 193,** Hauer teaches that the semiconductor substrate has at least one opening 5 between the first surface and the notch, the opening at least partially overlaps with the optoelectronic device.

12. **With respect to claim 194,** Hauer teaches that the optical reflector assembly is physically configured for optical coupling the core region of optical fiber to the optoelectronic device.

13. **With respect to claim 195,** Hauer teaches that the substrate comprises of one or more of glass, silicon, and ceramic (column 4, lines 62-66).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

16. Claim 180 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hauer.

17. **With respect to claim 180,** Hauer teaches that the electrical circuitry comprises a conductive trace to which the optoelectronic device is coupled (column 4, lines 61-66).

Hauer fails to teach that the conductive trace is a metal trace. However, the examiner takes official notice that it would have been obvious to one of ordinary skill in the art at the time the invention was made to use metal for the conductive trace to achieve to predictable result of conductively coupling an electronic device to a semiconductor substrate.

18. Claims 177, 179, and 188-191 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hauer in view of Reedy et al. (US 6,869,229) (hereinafter Reedy).

19. **With respect to claim 177,** Hauer teaches all of the limitations of claim 173 above.

Hauer fails to explicitly teach that the optoelectronic device is coupled to said semiconductor substrate via solderable bumps. Reedy teaches that an optoelectronic device is coupled to a semiconductor substrate via solderable bumps (column 13, lines 1-14). Because both Hauer and Reedy teach flip-chip bonding an optoelectronic component to a semiconductor substrate, it would have been obvious to one of ordinary skill in the art at the time the invention was made to couple the optoelectronic device to the semiconductor substrate via solderable bumps as taught by Reedy to achieve the predictable result of electrically coupling an optoelectronic device to the semiconductor substrate.

20. **With respect to claim 179,** Hauer teaches all of the limitations of claim 173 above.

Hauer fails to teach that the notch is partially filled with an optically transparent adhesive. Reedy teaches that a notch is partially filled with an optically transparent adhesive in order to immobilize the fiber while minimizing light losses caused by reflection or absorption at interfaces (column 15, lines 20-32).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the integrated circuit of Hauer with the optically transparent adhesive of Reedy for the benefit of immobilizing the fiber while minimizing light losses caused by reflection or absorption at interfaces.

21. **With respect to claim 188,** Hauer teaches all of the limitations of claim 173 above.

Hauer fails to teach that said opening is filled with an epoxy; wherein the epoxy has a refractive index that is substantially similar to that of the core region of the optical fiber. Reedy teaches that an opening is filled with an epoxy; wherein the epoxy has a refractive index that is substantially similar to that of the core region of the optical fiber in order to immobilize the fiber while minimizing light losses caused by reflection or absorption at interfaces (column 15, lines 20-32).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the integrated circuit of Hauer with the epoxy of Reedy for the benefit of immobilizing the fiber while minimizing light losses caused by reflection or absorption at interfaces.

22. **With respect to claim 189,** Hauer teaches all of the limitations of claim 175 above.

Hauer fails to teach that the semiconductor substrate comprises a first layer and a second layer, the first layer adjacent to the first surface. Reedy (e.g. Figures 1 and 2) teaches that a semiconductor substrate comprises a first layer and a second layer, the first layer adjacent to the first surface in order to reduce the parasitic capacitance between charged active regions and the substrate and to eliminate leakage currents flowing between adjacent active devices (column 5, lines 54-61).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the integrated circuit of Hauer with the semiconductor substrate of Reedy have a first layer and a second layer for the benefit of reducing the

parasitic capacitance between charged active regions and the substrate and eliminating leakage currents flowing between adjacent active devices.

23. **With respect to claim 190,** Reedy teaches that the optoelectronic device is configured to operate with light of substantially a wavelength spectrum and the first layer is transparent for light of substantially the wavelength spectrum (column 5, lines 36-41).

24. **With respect to claim 191,** Hauer (e.g. Figure 1) teaches that the optical reflector assembly is physically configured for optical coupling with the core region of optical fiber and the optoelectronic device.

25. Claims 182-184 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hauer in view of Aihara (US 2001/0004413) (hereinafter Aihara).

26. **With respect to claim 182,** Hauer teaches all of the limitations of claim 173 above.

Hauer fails to teach that the optical reflector assembly comprises at least one curved mirror. Aihara teaches that an optical reflector assembly comprises at least one curved mirror [0036] in order to maximize the efficiency of launching light from an optical fiber to a photodetecting region [0004] by forcing the reflected rays to become parallel, thereby minimizing the spreading of the reflected light bundle [0042].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the integrated circuit of Hauer with optical reflector assembly of Aihara comprising at least one curved mirror for the benefit of maximizing the efficiency of launching light from an optical fiber to a photodetecting region by

forcing the reflected rays to become parallel, thereby minimizing the spreading of the reflected light bundle.

27. **With respect to claim 183,** Aihara teaches that the curved mirror is a spherical mirror ([0036], [0042]).

28. **With respect to claim 184,** Hauer teaches that the optical reflector assembly further comprises a planar mirror (column 6, lines 63-67 – column 7, lines 1-4).

29. Claims 185 and 186 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hauer in view of Aihara as applied to claim 182 above, and further in view of Meyers et al. (US 4,451,119) (hereinafter Meyers).

30. **With respect to claim 185,** Hauer as modified by Aihara teaches all of the limitations of claim 182 above.

Hauer as modified by Aihara fails to teach that the optical reflector assembly comprises a glass substrate in contact with the curved mirror. Meyers (e.g. Figure 1) teaches that an optical reflector assembly comprises a glass substrate 20 in contact with a mirror 22 in order to provide a mirror with high optical quality suitable for high thermal energy applications (column 1, lines 12-18).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the optical reflector assembly of Hauer as modified by Aihara with the glass substrate of Meyers for the benefit of providing a mirror with high optical quality suitable for high thermal energy applications.

*Note that Hauer as modified by Aihara and Meyers teaches that the optical reflector assembly comprises a glass substrate in contact with the curved mirror.

31. **With respect to claim 186,** Hauer as modified by Aihara and Meyers teaches that the optical reflector assembly is coupled to the notch at the at least one inclined surface via an optical adhesive attaching the glass substrate to the at least one inclined surface (Meyers, column 2, lines 29-40).

32. Claim 187 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hauer as modified by Aihara and Meyers as applied to claim186 above, and further in view of Reedy.

33. **With respect to claim 187,** Hauer as modified by Aihara and Meyers teaches all of the limitations of claim 186 above.

Hauer as modified by Aihara and Meyers fails to teach that the optical adhesive has a refractive index that is substantially similar to that of the core region of the optical fiber. Reedy teaches that an optical adhesive has a refractive index that is substantially similar to that of the core region of the optical fiber in order to minimize light losses caused by reflection or absorption at interfaces (column 15, lines 20-27).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the integrated circuit of Hauer as modified by Aihara and Meyers with optical adhesive of Reedy for the benefit of minimizing light losses caused by reflection or absorption at interfaces.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to W. Wendy Kuo whose telephone number is (571)270-

1859. The examiner can normally be reached Monday through Friday 7:00 AM to 4:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sue A. Purvis can be reached at (571) 272-1236. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Leonardo Andújar/
Primary Examiner, Art Unit 2826

W. Wendy Kuo
Examiner
Art Unit 2826

WWK